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# U. S. DEPARTMENT OF AGRICULTURE

## FARMERS' BULLETIN

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(In Cooperation with the Department of Farm Management, New York State  
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### A SYSTEM OF FARM COST ACCOUNTING.

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#### INTRODUCTION.<sup>1</sup>

The farmer wishes to know how much he is making or losing on his business each year, how much he is making or losing on each crop or class of animals, and how he can improve his business so as to make more money. Cost accounting for the farm is the same sort of work which the large meat-packing companies are doing to learn whether they make a profit on canned goods, smoked meats, etc. The farmer wishes to know whether his wheat pays and whether his cows or orchard pay. These are some of the things which a set of farm cost accounts will show.

Many farmers are desirous of keeping accounts of this sort, but do not know how to start. Undoubtedly many are deterred from starting because they believe that they do not know enough about bookkeeping and because they have in mind no definite method of procedure. To any such men who desire to keep accounts and who have not worked out a system for themselves, it is believed that the system outlined in this paper will be helpful. Those who are already keeping accounts but are not satisfied with the results obtained may find here some suggestions of value.

Farm cost accounting, of necessity, involves many estimates, but there is no reason why one should lose faith or be discouraged because of them. If the worker has reasonably good judgment and is not prejudiced in favor of any crop or animal he can obtain satisfactory results. The systems of cost accounting in use by the large packing companies and by large wholesale grocery houses involve as many

<sup>1</sup> This system of farm cost accounting was developed by Prof. G. F. Warren, of the New York State College of Agriculture, on his own farm, where it has been in use for seven years. The principles of it are published in his book entitled "Farm Management." This system has been given a thorough trial for three years with a number of farmers under the immediate supervision of the writer of this bulletin, working jointly for the United States Department of Agriculture and the New York State College of Agriculture.

estimates and do not give any more accurate results than do well-kept farmers' accounts.

Cost accounts can not be absolutely exact. They contain many estimates. It is foolish to spend time with the refinements in methods of bookkeeping that are designed to check exact work to the last cent. In fact, attempts to find insignificant errors often disgust persons with the whole question of accounting.

Of the desirability of keeping accounts on a farm much has been said in the agricultural press. In an agricultural survey of Tompkins County, N. Y., made in 1907, it was found that 45 per cent. of the farmers already keep some sort of records or accounts.

This bulletin simply aims to give a description of a system of farm cost accounting which has been tried for three years in the State of New York with 53 farmers under widely differing conditions and has proved fairly successful. It is a method so simple that a farmer can keep it without assistance.

#### **TIME REQUIRED TO KEEP ACCOUNTS.**

The first question which the practical farmer asks about a set of accounts is, "How much time will it take?" The time required is one of the chief objections made to most kinds of farm cost accounting. The farmers who have used this particular system during the past year answer the question of time by estimates ranging from two to ten minutes a day. The average seems to be about five minutes for the daily entries. To this must be added a number of hours of work at the end of the year to close the accounts. This time will vary with the type of farming, the complexity of the business, and the degree of accuracy and completeness with which the accounts have been kept.

#### **BOOKKEEPING KNOWLEDGE UNNECESSARY.**

No bookkeeping knowledge is necessary. In all the cooperative work done so far, bookkeeping training, as sometimes given in commercial schools, has seemed a detriment rather than a help. Those trained in commercial bookkeeping have a tendency to insert technicalities and complexity of entry which would be all right for a business house, but which are entirely out of place for a practical farmer who wishes to do cost accounting. It is not necessary to know the difference between a daybook and a journal or to know how to get a trial balance in order to keep good farm cost accounts.

#### **A FAVORABLE TIME TO START ACCOUNTS.**

Accounts may be started on an ordinary farm any time after the last crop is harvested in the fall and before the first crop preparations are started in the spring. The exact date will depend upon the geographical location of the farm and the nature of the business or type

of farming in practice. The time should be as late as possible, in order that there may be the smallest quantity of last year's crops on hand to be inventoried. However, the date should be early enough to give the farmer sufficient time to close his year's accounts, work out results, plan the next year's business, and start new accounts before the spring crop work begins. In a large majority of cases this date will be January 1, March 1, or April 1. For a tenant the date for taking an inventory will, of course, correspond to the date of his lease.

#### REQUIREMENTS FOR KEEPING A COMPLETE SET OF FARM COST ACCOUNTS.

In order to have a complete set of farm accounts three records are necessary:

- (1) An inventory at the beginning and at the end of the year.
- (2) An account of all money paid out or received.
- (3) A record of all work done by men and horses during the year.

#### INVENTORY.

The inventory on an ordinary farm is a matter requiring from two to five hours' work at the beginning and at the end of the year. The same inventory, of course, is used for closing one year's accounts and starting the next, so that this work is done only once a year. This inventory should be a detailed list, with values, of the following: The farm, subdivided into buildings and land, each building being listed separately, with the number of acres of land and its value per acre (the total value of buildings and land listed being equal to the value of the farm); the horses, listed by name and giving their ages, followed by other live stock listed separately, giving value per head; machinery, each item being listed separately, except that small tools may be bunched as one item; quantities of feed, produce, and supplies on hand; growing crops (value of labor and materials already spent for next year's crops); cash on hand and in bank; and bills receivable. The total of all these should be found and the mortgage and bills payable, if any, subtracted from it. The difference is what the farmer is worth above debts, or his present net worth.

In estimating values, the market price at the farm, or the price at the selling place minus the cost of hauling to market, should always be the standard.<sup>1</sup> The value put upon anything should be what it is thought can be obtained for it at a normal sale and should neither be overrated nor underrated. In either case, one is fooling only one's self. It is better to be fair and unprejudiced and use one's best judgment.

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<sup>1</sup> A more complete discussion of this problem of determining values and depreciation is given in Farmers' Bulletin 511, entitled "Farm Bookkeeping," pp. 12-15.

TABLE I.—*A sample summary of an inventory.*<sup>1</sup>

Item.	Mar. 1, 1912.	Mar. 1, 1913.
Farm, 200 acres (including buildings).....	\$8,000	\$8,000
Cows:		
20 head at \$60.....	1,200	
15 head at \$70.....		1,050
Horses, 6.....	900	850
Machinery.....	783	800
Feed and supplies.....	1,100	850
Growing crops (cost of labor and materials).....	110	125
Cash.....	97	437
Bills receivable.....	75	95
Total resources.....	12,265	12,207
Mortgages and bills payable.....	3,125	2,300
Net worth.....	9,140	9,907
Gain for the year.....	767	
	9,907	9,907

<sup>1</sup> In the complete inventory each cow, horse, and machine is listed separately.

The form in Table I is presented here as a suggestion as to the way in which the inventory may be classified and summarized after two inventories are completed.

If preferred, the inventories may be kept on pages by themselves in the financial record book and the entering of inventory values to the individual accounts may be deferred until both inventories are complete and the accounts are being closed at the end of the year. The method of entering these amounts is given under "Closing the accounts at the end of the year."

No other account will give so much information for the time and labor expended as the annual inventory. By comparing the net worth as shown by the current inventory with the net worth shown by that of the previous year, the farmer can tell whether he has made a gain or loss and how much, after paying from farm receipts what he has expended for the living expenses of the family.

If money has been added to or taken from the business by gifts or by transfer from some other business that is not included in the inventory, these items would have to be known in order to tell the gain or loss. Usually the farmer lists all his property in the inventory, so that there is no chance for such an error. He may have only a small amount of cash on hand, as the gain may all be invested in a new team, additional cows, or extra feed. On the other hand, the cash on hand may be much larger than the year before, thus making the farmer feel more prosperous, whereas the number of head of stock or the quantity of feed on hand may be so much less that he has actually farmed at a loss that year.

The annual inventory shows the annual gain or loss on the farm business, but it does not show what crops or what animals have made a gain or loss. On nearly every farm where accounts have been kept,

the gain or loss for the year resulted from losses on several accounts and gains on several accounts. In every case the farmer was much surprised to see which accounts showed a gain and which a loss. Results like these can only be shown by a complete system of accounts.

#### FINANCIAL RECORD.

A record of the receipts and expenditures on the farm is necessary for a complete set of accounts. For this purpose a book called by stationers a "broad daybook," or "journal," is used. The requirements are that there be a place for a date on the left-hand side of the page, a broad space in the middle of the page in which to write explanations, and columns ruled for dollars and cents at the right. The page is ruled and items are entered as shown in the sample account with potatoes in Table II. The financial record book at the end of the year becomes the completed account book and will have a summary of labor entered in it from the work record as described later.

A separate account is kept with real estate, each crop grown, each class of animals, machinery, labor, interest, persons dealt with, bills payable and bills receivable, and with such other items as may be found necessary or convenient.

The items that make up bills payable and bills receivable should be listed in the inventory at the end of the year, as mentioned, either from memoranda or in any other way which may be found convenient. In closing out the inventory at the end of the year, the items for which money is due or owing should be charged or credited to their respective accounts. When these bills are settled, during the early part of the following year, the entries should be made under bills payable or bills receivable, as the case may be.

In this book two pages facing each other are taken for each account. The name of the account is written at the top of the page. The right-hand page is marked "Credits" and is used only to record credits to the account. The left-hand page is marked "Charges" and is used only for charges against the account. The pages then appear as shown in the sample account with a crop of potatoes (Table II).

TABLE II.—*A sample account with potatoes in a 14-acre field.*<sup>1</sup>

Charges.			Credits.		
1913.	Item.	Amount.	1913.	Item.	Amount.
June 3	Seed, 160 bushels, at 45 cents ..	\$72.00	Oct. 5	Sold, 226 bushels, at 60.18 cents.	\$136.00
4	Corrosive sublimate, 3 ounces. .	.30	20	Sold, 510 bushels, at 62 cents. .	316.20
10	Seed, 43½ bushels, at 55 cents ..	24.06	Nov. 1	Sold, 241 bushels, at \$1.083 . . .	261.02
11	Corrosive sublimate, 6 ounces. .	.60		Saved for seed, 135 bushels, at	
July 12	Paris green, 6 pounds. . . . .	1.32		\$1. . . . .	135.00
15	Lead arsenate, 160 pounds. . . .	14.40		Saved for home use, 16 bushels,	
	Use of land, 5 per cent on \$100			at 60 cents. . . . .	9.60
	per acre. . . . .	70.00		Residual manure, 60 per cent	
	Man labor, 796 hours, at 19.02			of 1911. . . . .	18.00
	cents. . . . .	151.40		Residual manure, 30 per cent	
	Horse labor, 839 hours, at 10.46			of 1910. . . . .	6.00
	cents. . . . .	87.76			
	Equipment labor, 339 hours, at				
	3.5 cents. . . . .	29.36			
	Manure, 60 per cent of 1910 ap-				
	plication. . . . .	12.00			
	Manure, 100 per cent of 1911 ap-				
	plication. . . . .	30.00			
	Total charges. . . . .	493.20			
	Gain. . . . .	388.62			
	Grand total. . . . .	881.82		Total credits. . . . .	881.82

<sup>1</sup> In the account book the items for "Charges" will occupy the entire left-hand page, and those for "Credits" the entire right-hand page.

Now, suppose that on a trip to town on June 1 one spends \$1.40 for horseshoeing, \$3 for fencing, \$5 for cow feed, and receives a \$65 check for 6,500 pounds of milk. The entries are made as follows: The account marked "Horses" is turned to and on the left-hand page is entered "June 1—Shoeing, \$1.40." The "Real estate" account is turned to and on the left-hand page is entered, "June 1—Fencing bought, \$3." The "Cows" account is turned to and on the left-hand page is entered, "June 1—Cow feed bought, \$5." On the right-hand page, under this same account, is credited, "June 1—Milk, 6,500 pounds, \$65."

These entries are now complete; they will never have to be posted or entered again in any way. It is often advisable to keep a memorandum book in the pocket in which to make notes when money is paid out in town, so that the items will not be forgotten before they can be entered in the account book.

Whenever money is paid out, the farmer turns to the account in the book to which this money should be charged and enters it on the left-hand page. Whenever money is received the amount is credited to the proper account by entering it on the right-hand page under that heading. These are the only entries made. The amounts are charged or credited directly to the accounts to which they belong.

To find the account wanted is made much easier by indexing the books in the following manner: Take a piece of adhesive tape about 1½ inches long, bend it double, and stick it on the edge of the page in such a manner that it projects about one-half inch. On this pro-

jection write the name of the account kept on that page. Put a piece of tape on each account, arranging them one below the other along the edge of the book so that all can be seen at the same time. Tabs suitable for this purpose can be purchased from most stationers.

#### WORK RECORD.

For the work record, a book ruled exactly like the financial record book, except that there should be two double columns at the right of the page, may be used. This should be indexed in the manner already described. In this book no separate pages are used for charges and credits and no entries are made in terms of dollars and cents. In the first double column at the right-hand side of the page are entered man hours and minutes, and in the second are written horse hours and minutes. These headings should be placed at the top of each column, so that the page appears as shown in Table III. This book contains simply a record of the work done on the farm during the year, classified according to the enterprise for which it was done, and it also gives the date and number of hours of each operation.

The sample record with wheat shown as Table III will serve to illustrate the way the items should appear in the work record.

TABLE III.—*A sample work record with wheat.*

1912.	Operation.	Man.		Horse. <sup>1</sup>	
		Hours.	Minutes.	Hours.	Minutes.
Aug. 2	Plowing oats stubble.....	8	30	17	.....
	Rolling.....	1	45	3	30

<sup>1</sup> Horse hours are expressed in terms of one horse for one hour. Hours of horse labor should not be charged against the horse account.

Suppose that the date is May 1. The work done on this day aside from chores was drilling in oats 6 hours, with 2 horses; plowing for corn 8 hours, with 3 horses; repairing plow, 2 hours of man labor alone. The entries are made as follows: The "Oats" account is turned to, "May 1" written in the left-hand column, the single word "Drilling" written in the broad space in the middle of the page, and the figure "6" entered under man hours. Since 2 horses were used for 6 hours, the figure "12" should be entered under horse hours. In the same way, on turning to the "Corn" account, "May 1—Plowing, 8 [under man hours], 24 [under horse hours]" is entered. Turning to the "Machinery" account "May 1—Repairing plow, 2 [under man hours]" is entered. When this is done, the work entry for the day is complete; it will never have to be posted or written again. The original entry is the only entry made.



For chores a special page should be ruled for each month, as shown in Table IV.

TABLE IV.—*A sample heading for a page of an account book showing the special ruling required for entering chores.*<sup>1</sup>

1913.	Horses.		Cows.		Poultry.		Hogs.	
	Hours.	Minutes.	Hours.	Minutes.	Hours.	Minutes.	Hours.	Minutes.
May 1.....	2	20	4	15	.....	30	1	10
2.....								
3.....								
4.....								
etc.....								

<sup>1</sup> If horses are used in the chore work, extra columns must be ruled under each heading to provide a place for the entry of hours and minutes of horse labor.

It is more accurate to enter the chores every day; but, if chore time is fairly uniform each day, so that the chore work for the entire month can be based on fewer entries, an entry at the beginning, at the middle, and at the end of the month will ordinarily be sufficient. Entries should be made at other times if the time spent on chores changes; for instance, when the cows are turned to pasture, when additional cows freshen, or when a change of feed is made which will require more time or less time for chore work.

#### DAILY WORK NECESSARY TO KEEP A COMPLETE SET OF ACCOUNTS.

The daily work of keeping a complete set of accounts ordinarily consists in entering receipts and expenses for that day and recording the hours of work done. On many days there are no cash receipts or expenses, as these are likely to be bunched on the days when trips are made to town. An actual day's entry made by one of the co-operators was as follows:

1912.	Item.	Man hours.	Horse hours.
July 5	Cultivating corn.....	6	12
	Cutting hay.....	4	8
	Unloading hay.....	1	1
	Eggs, 35 dozen at 22 cents.....		\$7.70
	Pulverizer repaired.....		.75
	Fork bought.....		.60

The entry of these items with the filling of the chore blanks for that day, if necessary, should not take more than five minutes. It is being done in less than an average of five minutes every day by 51 New York farmers, whose education varies from that acquired in a district school to that of the college graduate, all of whom are working every day in the field with their hired men.

**CLASSIFICATION OF FARM PRODUCTS AND FEED.**

Entries of the value of all home-grown feeds consumed must be made in the live-stock accounts. All the feed bought is charged in the financial record book directly against the animals for which it was bought. If the hog feed were to run out some day and a bag of cow feed were taken to the hogs, the entries should be made in the financial record book just as if the cows had sold this feed and the hogs had bought it.

At the time of thrashing or at the close of haying the total crop may be entered as a memorandum on the credit side of the proper crop account, but the figures are not yet to be carried to the money column. Estimates can be made with fair accuracy by measuring bins and haymows or by counting the loads drawn and estimating the average weight. The values will be entered when the product is sold or transferred to the animals. When these crops are fed out, an estimate must be made of the proportion fed to cows, horses, and other stock and these accounts charged with the values thereof, credit being given the crops. The quantity sold will be known from weighing bills, or otherwise, and it should be credited as a cash receipt.

Whenever grain or hay is fed from the same bin or mow to two or more classes of animals, a day's ration for each class of animals may be weighed or measured once a month or oftener and the proper proportion of the total feed, based on these weighings and the number of days fed, charged to each class of stock. This method will give a reasonable degree of accuracy if weights are taken fairly often. When cows and horses are fed from separate haymows, there will be no difficulty in keeping the feed separate. Where concentrates are purchased in large quantities and fed to several classes of animals, a record may be kept in the feed room of the number of sacks fed to each class of animals.

**CLASSIFICATION OF TROUBLESOME ITEMS.**

The entry of some items will be confusing to the beginner. Generally common sense will straighten him out if he will ask himself "What account really deserves this credit?" or "What account really deserves this charge?"

The real estate and the machinery accounts usually puzzle the beginner in keeping farm records. The former is more or less of a general account in this financial book and work record. All items for fencing, ditching, improvements, repair of buildings, removal of old fences, new buildings, taxes, and insurance should be charged to this account. Many of these are somewhat permanent and are charges which the landlord ordinarily pays on farms leased on share rental. This account should be credited with any receipts from

land rented out, old buildings sold, stone sold, and other similar items. If any special improvement is made, such as when a line of tile is laid, a building put up, or a silo built, one may open a separate account with it, if so desired. When complete, the cost should be figured and this amount charged against the real-estate account as an improvement.

Against the machinery account all costs of repairs to machinery and tools, all harness items, and the purchase of new implements or tools should be charged. This account should be credited with all receipts from sales of old machinery or machinery rented to neighbors. Under the work on machinery will be entered "Getting new plow points," "Repairing roller," "Storing away machinery," "Making new whiffletrees," and other similar items.

Such work as manuring may be charged against the crop to which it is applied, or an account may be kept with manure and the total cost of manure, including the cost of hauling, may be distributed to the different crops at the end of the year.

In this system no account is kept with "General expense." Nearly all items of this kind can be distributed as they occur. For instance, if a telephone is kept for the purpose of directing the hired man, the expense is charged direct to the labor account. If the telephone is kept for personal and general farm use, it may be charged partly to the personal and partly to the real-estate account. Such items as postage stamps, if small, may be charged to the farm account, but if a large number are used for one enterprise some of the purchases may be charged to this one enterprise.

It is nearly always possible to scatter the charges to different accounts as they occur. A general-expense account, if found to be necessary, should be kept very small.

#### MISCELLANEOUS NOTES.

There are many miscellaneous notes which it is desirable to keep in the same books with the accounts. Following are some of the entries which have been inserted by farmers and which are especially handy for later use. Sometimes they are merely written on the page where they seem to belong; at other times they are kept by themselves in the back of the book: Date of "last killing frost in spring;" date of "first killing frost in fall;" date of "death of [horse or cow];" "height of hay [or ensilage]" at a certain date.

Other miscellaneous records may be kept, such as herd records, maps of ditches, and maps of the farm, showing the crops for each year. These are not necessary in connection with the cost accounting, but may be kept if the farmer desires, and they will often prove useful.

**CLOSING THE ACCOUNTS AT THE END OF THE YEAR.**

Considerable time is required to close the set of accounts. However, this figuring should come in the winter at a time when other work is usually slack and when the weather is more favorable for working indoors than out. A definite order should be adhered to in closing the accounts. This order may be as follows:

(1) The first step is to take a final inventory in the same manner as at the beginning of the year. This inventory should include all bills that other persons owe the farmer and all bills which the farmer owes to other persons.

(2) The list of bills payable should be inspected and any items that have not yet been charged should be charged to the proper accounts. For instance, if \$15 for labor is still due the hired man at the date of closing, this item should be entered as a charge against labor.

(3) The list of bills receivable should be inspected, and any items that have not yet been credited should be credited to the proper accounts. For instance, if the creamery owes the farmer \$65 for milk and a neighbor owes him for some feed, the \$65 should be entered as a credit to the cow account and the feed item entered as a credit to the account from which the feed was originally taken.

(4) The record of all feed transferred to the live stock should be completed, charging the various animals and crediting the various crops. Produce raised and fed is charged against the animals at what it is worth on the farm. Suppose, for instance, there were 80 acres of hay with a total yield of 120 tons (20 tons of which had been sold and a credit entered) and that the feed-disposal memorandum showed 60 tons fed to the cows and 15 tons fed to the horses, leaving 25 tons on hand. If hay is worth \$12 per ton at the barn, the hay should be credited by entering on the right-hand page of the hay account "60 tons to cows @ \$12=\$720; 15 tons to horses @ \$12=\$180." Now, charges against the cows "60 tons of hay @ \$12" and against the horses "15 tons @ \$12" should be made. When the value of the hay on hand, 25 tons at \$12, as shown in the record inventory, is entered as a credit to the hay account, the credits to this account will be complete.

(5) The various classes of live stock should be credited with the portion of unused feeds which were charged to them at the time of purchase or harvest. These farm items will, of course, appear in the second inventory under the group headed "Feeds, produce, and supplies."

(6) The use of pasture should be credited directly to the real estate or to a pasture account and charged against the animals using it. The amount charged for pasture should be as nearly as possible the market price; that is, the price for which pasture rents in that region.

(7) The value of produce used in the house, if not noted before, should be entered. The proper crops or animals should be credited and charges made against the personal account. This item includes estimates of the quantities of milk, eggs, potatoes, and other products used by the family.

(8) The entry of value of board, produce, or other allowances furnished to the laborers should be completed. These charges should be made against labor and the proper accounts credited.

(9) The value of unpaid labor, such as work by the farmer himself, by boys in the family to whom regular wages are not paid, and milking or other farm work by women of the family should be entered. Make these charges against labor and credit the personal account.

(10) The animals should be credited with the value of the manure produced and this amount charged against the crops to which it was applied. The valuation of the

manure should be made at about the market price at the farm. To find the quantity produced, a record should be kept of the number of loads hauled to the fields.

(11) The proper amounts for the use of the buildings by crops, animals, the farmer, or laborers, should be entered. Each crop, each class of animals, the personal account, and the labor account should be charged with its proper proportion and credit of the real-estate account. As a general rule, 8 to 10 per cent of the current value of the buildings may be charged as rent. The proportion of the whole sum which each class of animals or each crop should pay will have to be determined by the farmer in proportion to the amount and value of the space occupied by each. Charges for the use of the buildings on one farm were made as follows:

[Value of barns, \$2,000; use for one year at 10 per cent, \$200.]

Account to be charged.	Percentage of \$200.	Amount.	Account to be charged.	Percentage of \$200.	Amount.
Cows.....	30	\$60.00	Horses.....	20	\$40.00
Hay.....	20	40.00	Corn.....	5	10.00
Oats.....	10	20.00			
Machinery.....	10	20.00	Total.....	100	200.00
Hogs.....	5	10.00			

(12) Taxes and insurance paid on personal property should be distributed to the proper accounts. All land taxes are charged to the real estate account and distributed as part of the "Use of land and buildings."

(13) All the hours and minutes of man labor on each enterprise, including the chores, should be added up, these totals being brought together and the sum of the man hours on all enterprises found.

(14) The total cost of man labor for the year should be found.

(15) The rate per hour should be found by dividing the total cost of man labor by the total hours of man labor.

(16) The total number of hours found against each enterprise in the work record should be transferred to the same accounts in the financial record, multiplying each total by the rate to obtain the cost. These items should be credited to labor in the financial record book. When this is completed, the labor account should balance within a few dollars, though if the rate per hour were carried out in full to the last decimal place the account would balance. A difference of 1 mill in the rate for 6,000 hours would make a difference of \$6 in the final results, and a difference of one-tenth of a mill would make a difference of 60 cents. This difference or error is not important enough to consider. It may be carried to the "Loss and gain" account, or it may be added to or subtracted from one of the larger items of labor, in accordance with whether it is a loss or a gain.

(17) All the hours and minutes of horse labor spent on each enterprise, including any horse labor on chores, should be added up, these totals being brought together and the sum of the horse hours on all enterprises found, just as was done for man labor.

(18) To find the total cost of horse labor, first the horse inventories should be entered, the first inventory as a charge and the second as a credit to the horses. Then the horses should be charged with interest on the average of the two inventories at the current rate in the section and the interest account credited. The ordinary rate charged in most parts of the United States is 5 or 6 per cent on the investment.

(19) The sum of each side of the horse account should be found. The sum of the credits should be subtracted from the sum of the charges and the difference will be the net cost of horse labor for the year. No charge is made against horses for the use of the harness and other horse equipment, all these costs being charged against the various enterprises in the machinery charge, as hereafter explained, on the basis of horse hours.

(20) The rate per hour of horse labor should be found by dividing the total cost by the total hours. The figure thus obtained is the rate per hour.

(21) The total number of horse hours found against each enterprise in the work record should be transferred to the same accounts in the financial record, multiplying each total by the rate to obtain the cost. These items should be credited to the horse account in the financial record book. When this is completed, the horse account should balance within a few dollars. The reason for the failure to balance is the same as that already given for man labor. To make the account balance, the difference can be added to or subtracted from one of the larger items or carried to the "Loss and gain" account, as stated in paragraph 16.

(22) To find the use cost of the machinery, the first machinery inventory should be entered as a charge and the second as a credit to the machinery account, then this account should be charged with interest on the average of the two inventories, as directed for the horse account. The interest account should be credited with the amount of this interest.

(23) The sum of each side of the machinery account should be found and the credit total subtracted from the charge total, the same as for the horse account. The difference is the total use cost of the machinery for the year.

(24) In order to distribute this cost, it may be assumed that for every hour horses were worked machinery was also used. Then each account will have charged against it the same number of machinery hours as horse hours. To find the rate of cost per machinery hour, the horse hours already charged to machinery should be first subtracted from the total hours of horse labor and the total cost of machinery use divided by this difference. Now the use of machinery for the year should be charged in the same way that the use of horses was charged, except the charge against machinery. When this is complete, the machinery account should balance within a few dollars. The difference may be treated as explained in paragraph 16.

(25) Any other accounts of convenience, such as those for fertilizer or manure, if kept, should be distributed.

(26) All the remaining items should be entered in the inventories. The inventory values for the beginning of the year should be entered on the left-hand page of the separate accounts as a charge; that is, the cow inventory should be entered on the left-hand page of the cow account, the hog inventory on the left-hand page of the hog account, and the others distributed in the same manner. The final inventory for the year is likewise distributed to the separate accounts, but the items are entered on their respective right-hand pages.

(27) The interest, based on the average inventories against all accounts not already charged, should be charged and the interest account credited with the total, using the same rate as that used in charging interest against the horse and machinery account.

(28) The proper charge for the use of the land should be entered. The rate should be high enough so that, with the use of buildings as charged in paragraph 11, it will cover interest on the investment in land and buildings, taxes on real estate, and repairs to buildings and fences, for these items were charged to the real-estate account. Each crop should be charged for the land it occupied and the real-estate account credited.

(29) Both sides of the accounts not yet closed should be footed up. The lesser total should be subtracted from the greater in each account. If the charge side is greater the difference represents a loss, and if the credit side be greater, a gain. The sample potato account given in Table II (p. 6) will illustrate a completed crop account.

(30) A list of the losses and gains should be made and the total of each found in order to show the net gain or loss on the whole business.

(31) Each account and the business as a whole should be studied in order to learn how to improve it.

## STUDY AND INTERPRETATION OF RESULTS.

Farm accounts are of little use unless studied and conclusions drawn which will enable one to make his business more profitable in the future. It is just as important to study the different items of cost and returns in an account as it is to know whether or not it pays. From such a study it is often possible to learn how to reduce the cost of production or increase the returns so as to make a losing enterprise pay and to make a profitable one more profitable. In studying the results of a year's business, one must keep constantly in mind that these are the results of a single year. Weather conditions, crop conditions, market conditions for the year as compared with an average year, must be considered. For instance, potatoes in 1912 showed large losses on many farms because of the low prices and the quantities lost by rot. However, by studying the potato account to find the cost of producing an acre, then, by considering both an average yield and price for the locality, one could draw the conclusion that ordinarily it would or would not be a profitable business to raise potatoes on most of the farms where potatoes are raised.

The potato account in Table II (p. 6) was studied when it was closed, and the following facts were obtained: Total acreage, 14; total yield, 1,128 bushels; yield per acre, 80.6 bushels, total cost of crop, \$469.20; cost per acre, \$33.51; total value of crop, \$857.82; value per acre, \$61.27; total profit, \$388.62; profit per acre, \$27.76; man hours per acre, 57; horse hours per acre, 60; labor cost per acre, \$10.81; horse labor cost per acre, \$6.27; cost per bushel, 41.6 cents; profit per bushel, 34.4 cents. The average value per bushel was higher than is ordinarily received for market potatoes.

Besides the satisfaction of actually knowing what crops or enterprises paid and how much, there are many other ways in which the accounts may be useful. They may be used to study the seasonal distribution of labor on the farm as a whole and on separate enterprises, and also to determine what crops and what animals are the most profitable. By comparing one's results with the facts detailed in bulletins on the same subject, one can find how his efforts compare with those of other farmers as to economy of labor, the working efficiency of horses, and many other points.

By keeping farm cost accounts one can not help but gain an idea of the value of labor. He soon finds that time represents money and that it is equally as important to save one as the other. He sees that it is just as important to save an hour's work by man and team on an acre of oats as it is to get a yield of an extra bushel per acre and that it is more wasteful to have a team idle than to have one man idle for the same length of time.

Farm cost accounts will help to teach one that very often the largest yields may not pay. After closing the accounts the farmer usually gets many surprises. Often he finds that the enterprises which he thinks are the best and to which he devotes most of his time are being conducted at a loss, while the steadier, more common enterprises or crops may be the only ones that show profits.

The system of farm cost accounting outlined in the foregoing pages is not a theoretical system, but one which for several years, with many types of farming and under widely differing conditions, has given satisfaction. It is hoped that what has been written will furnish helpful suggestions to farmers who are keeping accounts and are not satisfied with the results obtained from their present system, and that it will be a guide to be followed by many others who wish to keep accounts but have not known how to make a beginning.

